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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/544,054	YONA ET AL.
	Examiner	Art Unit
	Christopher E. Lee	2112

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 September 2005.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 12,23-30 and 39-67 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 12 and 30 is/are allowed.

6)☒ Claim(s) 23-29 and 39-67 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt Acknowledgement

1. Receipt is acknowledged of the Amendment filed on 26th of September 2005. Claim 23 has been amended; no claim has been canceled; and claims 29-67 have been newly added since the Non-Final Office Action was mailed on 24th of June 2005. Currently, claims 12, 23-30, and 39-67 are pending in this Application.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 50, 51 and 53-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Porter et al. [WO 93/15464; cited by the Applicant; hereafter Porter].

Referring to claim 50, Porter discloses a modular switch (i.e., backplane 20 with line switches in Fig 2), comprising:

- a plurality of backplane sub-buses (i.e., 'N' switched lines of Fig 3 and bus lines 1-96 of Fig 4; See page 7, lines 19-23 and page 14, lines 20-23),
    - each of the backplane sub-buses (i.e., each of said 'N' switched lines) comprising a different physical portion (i.e., each bus line of said 'N' switched lines has a different physical portion; See Fig. 4) of a single backplane bus (i.e., backplane 20 in Fig. 2); and
    - a plurality of cards (i.e., boards; See page 1, lines 9-10 and page 3, lines 21+) which are configurable to listen to a variable number of the backplane sub-buses (See page 4, lines 2-9 and page 15, line 25 through page 16, line 2).

Referring to claim 51, Porter teaches

- at least one of the plurality of cards (i.e., boards) listens to fewer than all the backplane sub-buses (See page 3, line 21 through page 4, line 6).

Referring to claim 53, Porter teaches

- each of the cards (i.e., boards) is configured to listen (i.e., communicate) to a respective group (i.e., cluster) of peer cards (i.e., a group of cards which have a particular aspect of the operation). Refer to page 4, lines 2-6 and page 8, line 19.

Referring to claim 54, Porter teaches

- the sub-buses to which each of the plurality of cards listens are the sub-buses to which the respective group of peer cards transmit (See page 4, lines 2-6; i.e., wherein in fact that board in a cluster communicates with other boards in the cluster inherently anticipates that an 'N' channel (i.e., sub-buses) to which each of said plurality of boards (i.e., a group of boards in a cluster) listens (i.e., communicate) is said 'N' channel (i.e., sub-buses) to which said respective group of peer cards (i.e., said group of boards in said cluster) communicate (i.e. transmit)).

Referring to claim 55, Porter teaches

- each card (i.e., board) listens to the cards which listen to it (i.e., because of communicating each other in a cluster of cards; See page 4, lines 2-6).

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gephardt et al. [US 5,901,332 A; hereinafter Gephardt] in view of LaBerge [US 5,771,358 A].

Referring to claim 23, Gephardt discloses a method of allocating backplane sub-buses (i.e., a method for dynamically reconfiguring subbusses on data bus 105 in Fig. 1; See Figs. 2 and 3) to cards (i.e., information processing devices 107, 109 and bus controller 111 in Fig. 1) of a switch (i.e., computer system in Fig. 6), comprising:

- determining bandwidth needs of each of the cards (See col. 4, lines 5-16); and
- allocating the backplane sub-buses (i.e., allocating CHANNELs for subbusses 202-208 in Fig. 2, or subbusses 302-322 in Fig. 3) to the cards (i.e., said information processing devices; See col. 4, lines 16-19);
    - wherein each of the backplane sub-buses (i.e., each of said CHANNELs) comprises a different physical portion of a single backplane bus (i.e., each CHANNEL is a physically different bit channel on a data bus comprising 64 channels data bus 105 in Fig. 2; See col. 1, lines 45-49 and col. 2, lines 61-67).

Gephardt does not teach assigning each of the cards a bus demand value which is a function of the bandwidth needs of the card and a current bandwidth allocated to the card; and said allocating the backplane sub-buses to the cards based on the bus demand values of the cards.

LaBerge discloses a method for apportioning computer bus bandwidth (See Abstract), wherein

- assigning each of cards (e.g., Hard Drive A 28 and Hard Drive B 30 in Fig. 1) a bus demand value (i.e., weighting value) which is a function (See col. 3, lines 35-36) of a bandwidth needs of the card and a current bandwidth allocated to the card (See Figs. 2-3 and col. 3, lines 45+); and
- allocating (i.e. apportioning) backplane sub-buses (i.e., bus bandwidth) to the cards (i.e., bus requesters, e.g., said Hard Drives) based on the bus demand values of the cards (See col. 3, lines 36-44 and col. 4, lines 21-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method for apportioning computer bus bandwidth, as disclosed by LaBerge, in said method of allocating backplane sub-buses, as disclosed by Gephardt, for the advantage of providing a dynamic bandwidth assignment of more bus bandwidth to the cards (i.e., bus requesters) that have recently used a high amount of bandwidth and of less bus bandwidth to those cards (i.e., bus requesters) that have not used the bus as much (See Gephardt, col. 2, lines 26-29).

Referring to claim 24, LaBerge teaches

- receiving (i.e., detecting) messages (i.e. address strobes) from the cards (See col. 5, lines 14-18).

Referring to claim 25, LaBerge teaches

- determining a measure of utilization (See Fig. 3-4) of the sub-buses currently allocated to the card (See col. 5, lines 38-61).

Referring to claim 26, LaBerge teaches

- listening (i.e. monitoring) to the sub-buses currently allocated to the card (See col. 5, lines 61-63).

Referring to claim 27, LaBerge teaches

- assigning a bus demand value (i.e. weighting value) which is a function of a priority (i.e., a function of predetermined value - a static maximum requester bandwidth) of the card (in fact, said static maximum requester bandwidth being allocated to said card, viz., priority; See col. 5, line 67 through col. 6, line 8).

Referring to claim 28, LaBerge teaches

- assigning a bus demand value (i.e. weighting value) which is a function of a minimal number of sub-buses which must be allocated to the card (See col. 5, lines 58-67; i.e., weighting value calculator calculates apportioning bus bandwidth based on an identified requester bandwidths implies that assigning a bus demand value is a function of a minimal number of sub-buses, i.e., identified bandwidths, which must be allocated to said card).

Referring to claim 29, LaBerge teaches

- allocating sub-buses not currently allocated to a specific card as additional sub-buses to the cards with the highest bus demand values (See col. 4, lines 30-32 and lines 37-46).

6. Claims 39-41, 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh et al. [US 5,625,780 A; hereinafter Hsieh] in view of Gephardt [US 5,901,332 A].

Referring to claim 39, Hsieh discloses a modular switch (i.e., motherboard 40 implementing a switched backplane in Fig. 4A), comprising:

- a plurality of backplane sub-buses (i.e., communication paths on shard bus and/or point-to-point bus among a plurality of PCBs 44 in Fig. 4A; See col. 6, lines 13-21 and col. 8, lines 39-57);
- a plurality of cards (i.e., PCBs 44 in Fig. 4A) which are each allocated one or more of the backplane sub-buses (i.e., each PCB is allocated a different physical connection for a particular communication path on microstrips; See col. 9, lines 22-26); and
- a controller (i.e., control interface circuit 54 of Fig. 4A) which dynamically allocates the backplane sub-buses to the plurality of cards (See col. 7, line 66 through col. 8, line 24).

Hsieh does not expressly teach each of the backplane sub-buses comprising a different physical portion of a single backplane bus, and the controller dynamically allocates the backplane sub-buses to the plurality of cards based on bandwidth needs of the cards.

Gephardt discloses a system for dynamically reconfiguring subbusses of data bus (See Abstract), wherein

- a plurality of backplane sub-buses (i.e., 64 CHANNELs on a data bus 105 in Fig. 2),
    - each of the backplane sub-buses (i.e., each of said CHANNELs) comprising a different physical portion of a single backplane bus (i.e., each CHANNEL is a physically different bit channel on a data bus comprising 64 channels data bus 105 in Fig. 2; See col. 1, lines 45-49 and col. 2, lines 61-67);
- a plurality of cards (i.e., information processing devices 107, 109, and data bus controller 111 in Fig. 1) which are each allocated one or more of the backplane sub-buses (i.e., allocating CHANNELs for subbusses 202-208 in Fig. 2, or subbusses 302-322 in Fig. 3); and
- a controller (i.e., data bus controller 111 of Fig. 1) which dynamically allocates the backplane sub-buses (i.e., said CHANNELs) to the plurality of cards (See col. 3, lines 1-50), based on bandwidth needs of the cards (See col. 5, lines 1-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said dynamic reconfiguration of subbusses (i.e., said bit CHANNELs), as disclosed by Gephardt, in said controller, as disclosed by Hsieh, for the advantage of providing a way to operate different portions of such buses at different speeds, such that the speed of each bus portion can be optimized for each data transfer requirement (See Gephardt, col. 1, lines 39-44).

Referring to claim 40, Gephardt teaches

- a bandwidth capacity (i.e. full bandwidth of data bus 105 of Fig. 1) of substantially all the backplane sub-buses (i.e., all 64 CHANNELs) is less than the sum of a maximal transmission bandwidth capacity of the cards (See col. 2, lines 61-67; i.e., in fact, said 64 CHANNELs

bandwidth is the maximum potential bandwidth, which could be less that the total bandwidth needs of said information devices).

Referring to claim 41, Gephardt teaches

- the controller (i.e., data bus controller 111 of Fig. 1) is implemented by one of the cards (See col. 2, lines 55-60).

Referring to claim 45, Gephardt teaches

- all the backplane sub-buses (i.e., 64 bit CHANNELs in Figs. 2 and 3) have the same bandwidth capacity (i.e., each CHANNEL has 1 bit bandwidth capacity; See col. 1, lines 45-49).

Referring to claim 46, Gephardt teaches

- the plurality of backplane sub-buses (i.e., 64 bit CHANNELs in Figs. 2 and 3) comprising at least two sub-buses (i.e., 64 information channels) with different bandwidths (See col. 3, lines 24-28; i.e., wherein in fact that the subbusses can operate at varying speeds implies said at least two sub-buses could be with different bandwidth. In other words, an information channel running in higher speed should have a larger bandwidth than an information channel running in lower speed).

7. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh [US 5,625,780 A] in view of Gephardt [US 5,901,332 A] as applied to claims 39-41, 45 and 46 above, and further in view of what was well known in the art, as exemplified by Zandy et al. [US 6,126,451 A; hereinafter Zandy].

Referring to claim 42, Hsieh, as modified by Gephardt, discloses all the limitations of the claim 42, including the controller (i.e., data bus controller 111 of Fig. 1; Gephardt) is implemented by one of the

cards (See Gephardt, col. 2, lines 55-60), except said one of the cards is selected dynamically as the controller.

The Examiner takes Official Notice that a plurality of controllers are implemented by cards, and one of the cards is selected dynamically as an active controller, what was well known to one of ordinary skill in the art, as evidenced by Zandy, at col. 2, lines 5-18.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have duplicated said controller (i.e., card) in the modular switch since it would have provided a redundancy of bus controller, and reduced down-time of modular switch (i.e., computer system) for repair or replacement of the controller cards for sub-buses (i.e., SCSI controller cards; See Zandy, col. 2, lines 19-20).

8. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh [US 5,625,780 A] in view of Gephardt [US 5,901,332 A] as applied to claims 39-41, 45 and 46 above, and further in view of Bonomi et al. [US 5,838,681 A; hereinafter Bonomi].

Referring to claim 43, Hsieh, as modified by Gephardt, discloses all the limitations of claim 43, including the cards transmit requests which indicate their bandwidth needs to the controller (See Gephardt, col. 5, lines 9-13), except that does not expressly teach the cards transmit messages which indicate their bandwidth needs to the controller.

Bonomi discloses a dynamic allocation of port bandwidth (See Abstract), wherein

- cards (i.e., adaptors 100 of Fig. 4) transmit messages (See col. 9, line 29) which indicate their bandwidth needs (i.e. an explicit request for bandwidth; See col. 9, line 25) to a controller (i.e., CPU 96 of Fig. 4). Refer to col. 9, lines 24-30.

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included said dynamic allocation of port bandwidth, as disclosed by Bonomi, in said switch, as

disclosed by Hsieh, as modified by Gephardt, for the advantage of allowing a bandwidth allocation based on the particular type of data awaiting transfer (See Bonomi, col. 9, lines 16-24).

9. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh [US 5,625,780 A] in view of Gephardt [US 5,901,332 A] as applied to claims 39-41, 45 and 46 above, and further in view of Jaramillo et al. [US 6,016,528 A; hereinafter Jaramillo].

Referring to claim 44, Hsieh, as modified by Gephardt, discloses all the limitations of claim 44, except that does not teach each of the cards has a priority value which indicates its entitlement to bandwidth and the controller allocates the backplane sub-buses based on the priority values of the cards.

Jaramillo discloses a priority arbitration system (See Abstract), wherein

- each of cards (i.e., each of devices 0-5 in Fig. 3) has a priority value which indicates its entitlement to bandwidth (See col. 5, lines 23-34) and
- a controller (i.e., PCI arbiter 508 of Fig. 5) allocates backplane (i.e., PCI bus) sub-buses (i.e., ownership of PCI bus cycles) based on the priority values (i.e., device priorities) of the cards (i.e., PCI agents 501-507 of Fig. 5). Refer to col. 5, lines 35+.

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included said priority arbitration system, as disclosed by Jaramillo, in said controller of said switch, as disclosed by Hsieh, as modified by Gephardt, for the advantage of providing predictable latency and guaranteed access for said cards coupled to said backplane sub-buses, and providing an arbitration process which is much more flexible with regard to allocating bus bandwidth (See Jaramillo, col. 8, lines 38-42).

10. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh [US 5,625,780 A] in view of Gephardt [US 5,901,332 A] as applied to claims 39-41, 45 and 46 above, and further in view of Shima et al. [US 2001/0043700 A1; hereinafter Shima].

Referring to claim 47, Hsieh, as modified by Gephardt, disclose all the limitations of claim 47, except that does not expressly teach the controller confiscates one or more sub-buses from one or more of the cards when the one or more sub-buses are more needed by one or more other cards.

Shima discloses a bandwidth allocation method (See Fig. 8), wherein

- a controller (i.e., peripheral device 230 of Fig. 2) confiscates one or more sub-buses (i.e., bandwidth) from one or more of cards (i.e., devices in multimedia network 100 of Fig. 1) when the one or more sub-buses are more needed by one or more other cards (See paragraph [0045], lines 1-7 on page 4).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have applied said bandwidth allocation method, as disclosed by Shima, to said controller of said switch, as disclosed by Hsieh, as modified by Gephardt, for the advantage of providing for dynamic reallocation of the bandwidth (See Shima, paragraph [0045], lines 13-14 on page 4).

11. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh [US 5,625,780 A] in view of Gephardt [US 5,901,332 A] and Shima [US 2001/0043700 A1] as applied to claim 47 above, and further in view of Nakano et al. [US 6,400,819 B1; hereinafter Nakano].

Referring to claim 48, Hsieh, as modified by Gephardt and Shima, discloses all the limitations of claim 10, including the bandwidth release stage, whereafter the controller allocates a confiscated sub-bus to a card (See Shima, paragraph [0045], lines 8-13 on page 4), except that does not teach the allocation should be processed after receiving confirmation from the card from which the sub-bus was confiscated that the sub-bus was freed from its allocation.

Nakano discloses a bandwidth release module (See Fig. 17), wherein

- a sub-bus (i.e., bandwidth) releasing stage includes a receiving confirmation (i.e., box 1704; wait for acknowledgement packet) from a card (i.e., release requestor) from which the sub-bus was confiscated that the sub-bus was freed from its allocation (See col. 13, lines 53-65).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included the bandwidth release module, as disclosed by Nakano, in the controller of the switch, as disclosed by Hsieh, as modified by Gephardt and Shima, for the advantage of providing an interface for accepting the bandwidth release with the receiving confirmation (See Nakano, col. 14, lines 5-6 and Fig. 17) before the dynamic reallocation of the bandwidth (See Shima, paragraph [0045], lines 13-14 on page 4).

12. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh [US 5,625,780 A] in view of Gephardt [US 5,901,332 A] as applied to claims 39-41, 45 and 46 above, and further in view of LaBerge [US 5,771,358 A].

Referring to claim 49, Hsieh, as modified by Gephardt, discloses all the limitations of claim 49, except that does not teach the controller calculates, for each of the cards, a bus demand value which represents an entitlement and need of the card to receive a sub-bus.

LaBerge discloses a method for apportioning computer bus bandwidth (See Abstract), wherein

- a controller (i.e., bus controller 24 of Fig. 1) calculates, for each of cards (i.e., bus requesters 26, 28, 30, 32 in Fig. 1), a bus demand value (i.e., weighting value) which represents an entitlement and need of the card to receive a sub-bus (See col. 3, lines 33-36), and
- the controller allocates free sub-buses which are not allocated to the cards with the highest bus demand values (See col.4, lines 30-32 and lines 37-40).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have applied said bandwidth allocation method, as disclosed by LaBerge, to said controller of said switch, as disclosed by Hsieh, as modified by Gephardt, for the advantage of apportioning said bandwidth based on said bus demand value enables higher bandwidth cards to continue to operate at a relatively high bandwidth when said bus is saturated (See LaBerge, col. 6, lines 19-21).

13. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464] as applied to claims 50, 51, and 53-55 above, and further in view of LaBerge [US 5,771,358 A].

Referring to claim 52, Porter discloses all the limitations of claim 52, except that does not teach a controller which dynamically changes the sub-buses to which each card listens.

LaBerge discloses a controller (i.e., bus controller 24 of Fig. 1), wherein

- said controller dynamically changes (See col. 2, lines 23-29) sub-buses to which each card listens (See col. 5, lines 9+).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included the dynamic embodiment of the controller, as disclosed by LaBerge, in the modular switch, as disclosed by Porter, for the advantage of enabling higher bandwidth cards to continue to operate at a relatively high bandwidth when said backplane sub-bus is saturated (See LaBerge, col. 6, lines 19-21).

14. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464].

Referring to claim 56, Porter discloses all the limitations of claim 56, except that does not teach at least one card listens to fewer than all the cards that listen to it.

The Examiner takes Official Notice that the configuration (i.e., few-to-many work group environment) is well known in the art of work group environment setting with access privileges in network (e.g., Windows NT environment), what was well known to one of ordinary skill in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to recognize the at least one card listens to fewer than all the cards that listen to it via the work group environment setting with access privileges since it would have allowed for greater security in the work group.

15. Claims 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464] as applied to claims 50, 51, and 53-55 above, and further in view of Fan et al. [US 6,219,706 B1; hereinafter Fan].

Referring to claims 57 and 58, Porter discloses all the limitations of claims 57 and 58, respectively, except that does not teach 1) the peer group of one or more cards changes as a function of time, and further, 2) the peer groups are reduced in size during high security times.

Fan discloses a firewall (i.e., access control system; See Abstract), wherein

- a group of cards (i.e., particular users; See col.8, line 20) changes as a function of time (See col.8, lines 19-21 and col. 9, lines 27-28), and further
  - o the peer groups are reduced in size during high security times (See col.8, lines 21-24; i.e. wherein the fact that certain users cannot communicate outside the local area network during non-business hours implies that said group including said certain users (i.e. peer group) is reduced in size during non-business hours (i.e. high security times)).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included the access control system, as disclosed by Fan, in the modular switch, as disclosed by

Porter, for the advantage of protecting a local area network using said modular switch from all uninvited sessions initiated externally (See Fan, col. 8, lines 13-15).

16. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464] as applied to claims 50, 51, and 53-55 above, and further in view of Ha-Duong [US 5,768,270 A].

Referring to claim 59, Porter discloses all the limitations of claim 59, except that does not teach a filter which passes to the card only data from the sub-buses to which the card listens.

Ha-Duong discloses an ATM switch (See Abstract), wherein

- a filter for at least one of cards which passes to the card only data from sub-buses to which the card listens (See col. 6, lines 17-20; i.e. wherein the fact that a filter handles an input line of a concentrator in order to eliminate ATM cells which are not destined for its group of outputs implies that said filter for input line of concentrator (which is ultimately connected to at least one of said cards) passes to said card only ATM cells (i.e. data) from two-way lines (i.e. said sub-buses) to its group of outputs (i.e. to which said card listens)).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included the filter in the ATM switch, as disclosed by Ha-Duong, in the modular switch, as disclosed by Porter, for the advantage of outputting relevant ATM cells to said card (i.e. concentrator) (See Ha-Duong, col. 7, lines 4-5).

17. Claims 60-62 and 64-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464] in view of LaBerge [US 5,771,358 A].

Referring to claim 60, Porter discloses a modular switch (i.e., backplane 20 with line switches in Fig 2), comprising:

- a plurality of communication cards (i.e., boards; See page 1, lines 9-10 and page 3, lines 21+);

- a plurality of backplane sub-buses (i.e., 'N' switched lines of Fig 3 and bus lines 1-96 of Fig 4; See page 7, lines 19-23 and page 14, lines 20-23)
    - each allocatable to one or more of the cards (i.e., a cluster of boards together; See page 4, lines 2-6),
    - each of the backplane sub-buses (i.e., each bus line of said 'N' switched lines) comprising a different physical portion (i.e., each bus line of said 'N' switched lines has a different physical portion; See Fig. 4) of a single backplane bus (i.e., backplane 20 in Fig. 2); and
- at least one controller (i.e., switching circuits 26 and central processing unit 27 of Fig. 2) which is configurable to divide the cards (i.e., boards) into different numbers of groups (See Fig. 1 and page 14, line 22 through page 15, line 12 and page 15, line 28 through page 16, line 2), such that the cards of the different groups do not transmit data to each other (See page 15, lines 6-12 and line 25 through page 16, line 2; i.e., wherein in fact that the position of all the switches within the two sets is determined and therefore the relative conditions of interconnections between each of the slots and the bus is determined by such configuration implies that said cards of the different groups (i.e., different clusters) do not transmit data to each other (i.e., do not communicate)).

Porter does not teach the at least one controller is further configurable to allocate the sub-buses to the cards based on bus demand values of the cards.

LaBerge discloses a system for apportioning computer bus bandwidth (See Abstract), wherein

- at least one controller (i.e., bus controller 24 of Fig. 1) is configurable to allocate (i.e. apportioning) the sub-buses (i.e. bus bandwidths) to cards (i.e. bus requesters) based on bus demand values of the cards (See col. 3, lines 36-44 and col. 4, lines 21-28).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have applied the bandwidth allocation method, as disclosed by LaBerge, to the modular switch, as

disclosed by Porter, for the advantage of apportioning the bandwidth based on the bus demand value enables higher bandwidth cards to continue to operate at a relatively high bandwidth when the bus is saturated (See LaBerge, col. 6, lines 19-21).

Referring to claim 61, Porter teaches

- the at least one controller is configurable to divide the cards into any number of groups between one and the number of cards (See page 4, lines 2-6 and page 15, line 25 through page 16, line 2; i.e., wherein in fact that the invention gives massive flexibility to a backplane and allows a wide number of different cluster configurations implies that switching circuits and processing unit (i.e., controller) is configurable to divide said slots into any number of groups between one and said number of slots).

Referring to claim 62, Porter teaches

- the number of groups are configured by a user (See page 15, lines 10-17; i.e., wherein in fact that after configuring, the condition of the interconnection remains unchanged, during normal operation until modification desired, and the condition of each switch can be determined during alteration implies that said number of groups (i.e., number of clusters) are configured (i.e., reconfigured) by a user (i.e., by alteration of programming instruction)).

Referring to claim 64, Porter teaches

- the cards of the different groups do not communicate (viz., do not transmit data to each other; See page 15, lines 6-12 and line 25 through page 16, line 2; i.e., wherein in fact that the position of all the switches within the two sets is determined and therefore the relative conditions of

interconnections between each of the slots and the bus is determined by such configuration implies that said cards of the different groups (i.e., different clusters) do not communicate).

Referring to claim 65. Porter teaches

- the cards of the different groups do not communicate (viz., do not transmit data to each other) over any of the plurality of backplane sub-buses (See page 15, lines 6-12 and line 25 through page 16, line 2; i.e., wherein in fact that the position of all the switches within the two sets is determined and therefore the relative conditions of interconnections between each of the slots and the bus is determined by such configuration implies that said cards of the different groups (i.e., different clusters) do not communicate over any of said plurality of backplane sub-buses).

Referring to claim 66, Porter, as modified by LaBerge, discloses all the limitations of the claim 66, including a box (i.e., a computer backplane; See Porter, Fig. 2 and title) having a plurality of slots (i.e., slots 21 of Fig. 2; Porter) in which the cards (i.e., cards in said slots) are located, except that does not expressly teach the cards of at least one group are not located in adjacent slots.

The Examiner takes Official Notice that the cards of one group are not located in adjacent slots (i.e. all said cards are inserted into non-adjacent slots) is well known in the art of backplane bus configuration with a technology of programmatic switching circuitry, what was well known to one of ordinary skill in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to recognize the cards of one group are not located in adjacent slots since it would have allowed for greater flexibility to the cards being physically located at any slot in the box.

18. Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464] in view of LaBerge [US 5,771,358 A] as applied to claims 60-62 and 64-66 above, and further in view of Applicant's Admitted Prior Art [hereinafter AAPA].

Referring to claim 63, Porter, as modified by LaBerge, discloses all the limitations of the claim 63, including the at least one controller (i.e., switching circuits 26 and central processing unit 27 of Fig. 2) divides the cards (i.e., boards) into a number of groups (See Porter, Fig. 1 and page 14, line 22 through page 15, line 12 and page 15, line 28 through page 16, line 2), except that does not teach the number of groups equal to a number of types of cards included in the plurality of cards.

AAPA discloses a modular switch (See page 1, lines 6-8), wherein AAPA states

- it is desired to form separate connections using different protocols (i.e., different types of communication cards) without signal conversion by creating separate networks which are not interconnected (See page 2, lines 6-9; i.e., wherein in fact that said different types of communications cards forms said separate networks without said signal conversion implies that said number of separate networks (i.e. number of groups) equal to said different types of communications cards (i.e. number of types of cards) included in said plurality of communications cards (i.e. said plurality of cards)).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have applied the grouping method, as disclosed by AAPA, to the modular switch, as disclosed by Porter, as modified by LaBerge, for the advantage of Ethernet and ATM can be interconnected without signal conversions (See AAPA, page 2, lines 7-8).

19. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Porter [WO 93/15464] in view of LaBerge [US 5,771,358 A] as applied to claims 60-62 and 64-66 above, and further in view of Riley [US 5,875,351 A].

Referring to claim 67, Porter, as modified by LaBerge, discloses all the limitations of claim 67, except that does not teach only one card writes to a sub-bus at any single time.

Riley discloses a distributed DMA architecture (See Abstract), wherein

- only one card (i.e., network card 120 of Fig. 2) writes to a sub-bus (i.e., PCI bus 112 of Fig. 2) at any single time (See Fig. 8 and col. 19, lines 19-30).

Therefore, it would have been obvious one of ordinary skill in the art at the time the invention was made to have included the distributed DMA architecture, as disclosed by Riley, in the modular switch, as disclosed by Porter, as modified by LaBerge, for the advantage of individual DMA channels can be distributed among the cards requiring DMA transfers, thereby supporting DMA on the sub-bus without requiring any change to existing software (See Riley, col. 4, line 65 through col. 5, line 2).

Allowable Subject Matter

20. Claims 12 and 30 are allowed.

21. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 12 and 30, the limitations of those claims are deemed allowable over the prior art of record as the prior art fails to teach or suggest that the controller confiscates sub-buses from cards whose bus demand value without the confiscated sub-buses is lower than the bus demand value of a different card after the confiscated sub-buses are transferred to it.

Response to Arguments

22. Applicant's arguments with respect to claims 23-30, and 39-67 have been considered but are moot in view of the new grounds of rejection.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Parruck et al. [US 6,751,214 B1] disclose method and apparatus for dynamically allocating bandwidth between ATM cells and packets.

Kaganoi et al. [US 6,513,078 B1] disclose data transfer control apparatus, data transfer control system and data transfer control method.

Hayes [US 4,933,845] discloses reconfigurable bus.

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher E. Lee whose telephone number is 571-272-3637. The examiner can normally be reached on 9:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen can be reached on 571-272-3676. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher E. Lee
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